The Drawings and Profiles now asked for, are intended to be a complete record of all the work done in each month up to the end of the year.

In addition to the above, I have to request that you will furnish as soon as possible detailed Schedules ([illegible]) of Excavations and Embankments in each Contract within the limits of your District.

These Schedules should be in the Form of those printed for the last Tenders called for and should be as much in detail as may seem necessary. At the same time you will be good enough to prepare and forward Schedules (according to the printed forms) of all structures deemed necessary, but before the final adoption of the latter, I shall probably require some further consultation with you.

The above refers to all Contracts as far as applicable. I need scarcely add that all the documents asked for should be signed by yourself in attestation of their accuracy. They are intended as Records for this Office.

Signed, SANDFORD FLEMING,
Chief Engineer.

INTERCOLONIAL RAILWAY.

TABLE OF QUANTITIES

IN

CULVERTS AND OTHER STRUCTURES.

Ottawa:
PRINTED BY HUNTER, ROSE & COMPANY.
1871.

INTERCOLONIAL RAILWAY.

TABLES OF QUANTITIES IN STRUCTURES.

These Tables were prepared for the purpose of facilitating the calculations of quantities in the different sections of the line, preliminary to asking for Tenders. It is believed they will prove useful in many ways to members of the staff, and they are published for that purpose.

Tables D, E and F, give quantities in the various kinds of Box Culverts under all Embankments up to 80 feet in height.

Table G gives the leading dimensions of all Arch Culverts between 4 feet and 20 feet span, according to the accompanying standard diagram.

Table H gives the half lengths of level arch culverts from 4 feet to 20 feet span for all heights of embankment under 80 feet (this table is supplementary to and to be used instead of Table A in General Intructions No. 4 for Arch Culverts. For Box Culverts, Table A should be used).

Table I gives quantities in 4 feet Arch Culverts.
Table K do 5 feet Arch "
Table L do 6 feet Arch "
Table M do 8 feet Arch "
Table N do 10 feet Arch "
Table O do 12 feet Arch "
Table P do 14 feet Arch "
Table Q do 16 feet Arch "
Table R do 18 feet Arch "
Table S do 20 feet Arch "

Table T gives quantities in Beam Culverts and Bridges, according to the accompanying standard diagram and sheet No. 11 in Lithographed General Plans.

It was intended to add to these Tables some data by which the quantities in inclined culverts might be approximately estimated, but it has been found that no reliable rule can be laid down. Various attempts were made to establish a formulæ which would give an approximation for average ground; a per centage varying from three to twenty-five per cent. was added to the quantities in the within Tables, in preparing some of the schedules for intending Contractors, but experience has shown that the actual increase is so very variable owing to the changeable character of the foundation strata, that no formulæ can be depended on even for rough estimates.

The General Plans referred to in these Tables are those lithographed and published, and the General Instructions, together with Tables A, B and C, are those previously printed in connexion with this line of Railway.

SANDFORD FLEMING,
Chief Engineer.

OTTAWA, Dec. 31st, 1870.

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INTERCOLONIAL RAILWAY.

TABLES OF QUANTITIES IN CULVERTS, &c.

TABLE D. (*Level*)—Box Culverts, 2ft. 6in. × 2ft. 6in.

This is a Table of Quantities in Box Culverts 2ft. 6in. × 2ft. 6in. according to Lithographed General Plans, Sheet No. 3, *adopted for the construction of the Intercolonial Railway. The heights of Formation above surface of Paving on centre line of Railway being known, the lengths correspond with those found in* Table A, General Instructions No. 4, *and the quantities are as herein given.*

The Table is calculated on the following data :

Per foot run of Culvert........................Masonry, 1.093 cub. yds. Paving, 0.0926 cub. yds.
Additional for Upper end of Culvert.. Do 2.900 " Do 2.5000 "
Additional for Lower end of Culvert.. Do 3.900 " Do 2.5000 "

Height of Formation Level above Surface of Paving.	Length of Box. Feet.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Box. Feet.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
5 feet.	22.0	30.6	7.0	25 feet.	86.0	100.8	13.0
6	25.0	34.1	7.3	26	89.0	104.1	13.2
7	28.0	37.4	7.6	27	92.0	107.4	13.5
8	31.0	40.7	7.9	28	95.0	110.7	13.8
9	34.0	44.0	8.2	29	98.0	113.9	14.1
10	38.0	48.4	8.6	30	102.0	118.3	14.4
11	41.0	51.7	8.9	31	105.0	121.6	14.7
12	44.0	55.0	9.2	32	108.0	124.9	15.0
13	47.0	58.3	9.5	33	111.0	128.2	15.3
14	50.0	61.6	9.8	34	114.0	131.5	15.6
15	54.0	66.0	10.2	35	118.0	135.7	16.0
16	57.0	69.3	10.5	36	121.0	139.0	16.3
17	60.0	72,6	10.8	37	124.0	142.3	16.5
18	63.0	75.9	11.1	38	127.0	145.6	16.8
19	66.0	79.2	11.3	39	130.0	148.8	17.0
20	70.0	83.1	11.5	40	134.0	153.2	17.4
21	73.0	86.5	11.8	41	137.0	156.5	17.7
22	76.0	89.8	12.0	42	140.0	159.8	18.0
23	79.0	93.1	12.3	43	143.0	163.1	18.3
24	82.0	96.4	12.6	44	146.0	166.4	18.6

TABLE D.—*Continued.*

This is a Table of Quantities in Box Culverts 2ft. 6in. × *2ft. 6in. according to* LITHOGRAPHED GENERAL PLANS, SHEET NO. 3, *adopted for the construction of the Intercolonial Railway. The height of Formation above surface of Paving on centre line of Railway being known, the lengths correspond with those found in* TABLE A, GENERAL INSTRUCTIONS NO. 4, *and the quantities are as herein given.*

The Table is calculated on the following data :

Per foot run of Culvert	Masonry,	1.093	cub. yds.	Paving,	0.0926	cub. yds.
Additional for Upper end of Culvert..	Do	2.900	"	Do	2.5000	"
Additional for Lower end of Culvert..	Do	3.900	"	Do	2.5000	"

Height of Formation Level above Surface of Paving.	Length of Box. Feet.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Box. Feet.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
45 feet.	150.0	170.8	19.0	63 feet.	207.0	233.1	24.1
46	153.0	174.0	19.2	64	210.0	236.4	24.4
47	156.0	177.2	19.5	65	214.0	240.7	24.8
48	159.0	180.5	19.8	66	217.0	244.0	25.2
49	162.0	183.8	20.1	67	220.0	247.3	25.5
50	166.0	188.2	20.5	68	223.0	250.6	25.8
51	169.0	191.5	20.8	69	226.0	253.9	26.1
52	172.0	194.8	21.1	70	230.0	258.3	26.5
53	175.0	198.1	21.4	71	233.0	261.6	26.8
54	178.0	201.4	21.7	72	236.0	264.7	27.1
55	182.0	205.8	22.1	73	239.0	267.9	27.4
56	185.0	209.0	22.3	74	242.0	271.1	27.7
57	188.0	212.2	22.5	75	246.0	275.5	28.1
58	191.0	215.5	22.7	76	249.0	278.8	28.4
59	194.0	218.8	23.0	77	252.0	282.1	28.7
60	198.0	223.2	23.3	78	255.0	285.4	29.0
61	201.0	226.5	23.6	79	258.0	288.7	29.3
62	204.0	229.8	23.9	80	262.0	293.1	29.7

For approximate quantities in inclined Culverts, see Table Q.

TABLE E. (*Level*)—Box Culverts, 2ft. 6in. × 4ft. 0.

This is a Table of Quantities in Box Culverts, 2ft. 6in. × 4ft. 0., according to Lithographed General Plans, Sheet No. 3, *adopted for the construction of the Intercolonial Railway. The heights of Formation above surface of Paving on centre line of Railway being known, the lengths correspond with those found in* Table A, General Instructions No. 4, *and the quantities are as herein given.*

The Table is calculated on the following data:

Amount per foot run of Culvert......	Masonry,	1 37	cub. yds.	Paving,	0.0926	cub. yds.
Additional for Upper end of Culvert..	Do	3.19	"	Do	3.33	"
Additional for Lower end of Culvert..	Do	4.1[illegible]	"	Do	3.33	"

Height of Formation Level above Surface of Paving.	Length of Box. Feet.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Box. Feet.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
6feet.	21	36.1	8.6	26 feet.	85	123.7	14.5
7	24	40.2	8.9	27	88	127.8	14.8
8	27	44.3	9.2	28	91	131.9	15.1
9	30	48.4	9.4	29	94	136.0	15.4
10	34	53.8	9.8	30	98	141 6	15.8
11	37	58.0	10.0	31	101	145.7	16.1
12	40	62.1	10.3	32	104	149.8	16.4
13	43	66.2	10.6	33	107	153.9	16.6
14	46	70.3	10.9	34	110	158.0	16.9
15	50	75.7	11.3	35	114	163.5	17.3
16	53	79.8	11.6	36	117	167.6	17.6
17	56	83.9	11.9	37	120	171.7	17.9
18	59	88.0	12.2	38	123	175.8	18 1
19	62	92.1	12.4	39	126	179.9	18.4
20	66	97.8	12.8	40	130	185.4	18.8
21	69	101.9	13.1	41	133	189.5	19.1
22	72	106.0	13.4	42	136	193.6	19.4
23	75	110.1	13.7	43	139	197.7	19.7
24	78	114.2	13.9	44	142	201.8	19.9
25	82	119.6	14.3	45	146	207.3	20.3

TABLE E.—*Continued.*

This is a Table of Quantities in Box Culverts 2ft. 6in × 4ft. 0in., according to Lithographed General Plans, Sheet No. 3, *adopted for the construction of the Intercolonial Railway. The heights of Formation above surface of Paving on centre line of Railway being known, the lengths correspond with those found in* Table A, General Instructions No. 4, *and the quantities are as herein given.*

The Table is calculated on the following data:

Amount per foot run of Culvert.......Masonry, 1.37 cub. yds. Paving, 0.0926 cub. yds.
Additional for Upper end of Culvert.. Do 3.19 " Do 3.33 "
Additional for Lower end of Culvert.. Do 4.16 " Do 3.33 "

Height of Formation Level above Surface of Paving.	Length of Box. Feet.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Box. Feet.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
46 feet.	149	211.4	20.5	64 feet.	206	289.5	25.9
47	152	215.5	20.8	65	210	295.0	26.2
48	155	219.6	21.1	66	213	299.2	26.5
49	158	223.7	21.4	67	216	303.3	26.7
50	162	229.3	21.8	68	219	307.4	27.0
51	165	233.4	22.1	69	222	311.5	27.3
52	168	237.5	22.4	70	226	317.0	27.7
53	171	241.6	22.6	71	229	321.1	27.9
54	174	245.7	22.9	72	232	325.2	28.2
55	178	251.2	23.3	73	235	329.3	28.5
56	181	255.3	23.6	74	238	333.4	28.8
57	184	259.4	23.9	75	242	338.9	29.2
58	187	263.5	24.1	76	245	343.0	29.5
59	190	267.6	24.4	77	248	347.1	29.8
60	194	273.1	24.8	78	251	351.2	30.1
61	197	277.2	25.1	79	254	355.3	30.4
62	200	281.3	25.4	80	258	360.8	30.7
63	203	285.4	25.7				

For approximate quantities in inclined Culverts, see special memoranda.

TABLE F. (*Level*)—Double Box Culverts, 2ft. 6in. × 4ft. 0.

This is a Table of Quantities in Double Box Culverts, 2ft. 6in. × 4ft. 0., according to Lithographed General Plans, Sheet No. 4, *adopted for the construction of the Intercolonial Railway. The heights of Formation above surface of Paving on centre line of Railway being known, the lengths correspond with those found in* Table A, General Instructions No. 4, *and the quantities are as herein given.*

The Table is calculated on the following data :

Amount per foot run of Culvert......	Masonry,	2.20 cub. yds.	Paving,	0.185 cub. yds.
Additional for Upper End..............	Do	3.66 "	Do	5.16 "
Additional for Lower End..............	Do	6.00 "	Do	5.16 "

Height of Formation Level above Surface of Paving.	Length of Arch. Feet.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch. Feet.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
6 feet.	21	55.9	14.2	26 feet.	85	196.6	26.0
7	24	62.5	14.7	27	88	203.2	26.5
8	27	69.1	15.3	28	91	209.8	27.1
9	30	75.7	15.9	29	94	216.5	27.6
10	34	84.5	16.6	30	98	225.4	28.4
11	37	91.1	17.2	31	101	232.0	29.0
12	40	97.7	17.7	32	104	238.6	29.5
13	43	104.3	18.2	33	107	245.2	30.1
14	46	110.9	18.8	34	110	251.8	30.6
15	50	119.7	19.5	35	114	260.6	31.4
16	53	126.3	20.1	36	117	267.2	31.9
17	56	132.9	20.6	37	120	273.8	32.5
18	59	139.5	21.1	38	123	280.4	33.0
19	62	146.1	21.7	39	126	286.8	33.6
20	66	154.9	22.5	40	130	295.6	34.4
21	69	161.5	23.0	41	133	302.2	34.9
22	72	168.1	23.6	42	136	308.8	35.5
23	75	174.7	24.1	43	139	315.4	36.0
24	78	181.3	24.7	44	142	322.0	36.5
25	82	190.1	25.4	45	146	330.8	37.3

TABLE F.—*Continued.*

This is a Table of Quantities in Double Box Culverts 2ft. 6in. × *4ft. 0in., according to* LITHOGRAPHED GENERAL PLANS, SHEET NO. 4, *adopted for the construction of the Intercolonial Railway. The heights of Formation above surface of Paving on centre line of Railway being known, the lengths correspond with those found in* TABLE A, GENERAL INSTRUCTIONS NO. 4, *and the quantities are as herein given.*

The Table is calculated on the following data :

Amount per foot run of Culvert......	Masonry,	2.20 cub. yds.	Paving,	0.185 cub. yds.
Additional for Upper End..............	Do	3.66 "	Do	5.16 "
Additional for Lower End..............	Do	6.00 "	Do	5.16 "

Height of Formation Level above Surface of Paving.	Length of Arch. Feet.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch. Feet.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
46 feet.	149	337.4	37.8	64 feet.	206	462.8	48.4
47	152	344.0	38.4	65	210	471.6	49.2
48	155	350.6	38.9	66	213	478.2	49.7
49	158	357.2	39.4	67	216	484.8	50.3
50	162	366.0	40.2	68	219	491.4	50.8
51	165	372.6	40.7	69	222	498.0	51.4
52	168	379.2	41.3	70	226	506.8	52.2
53	171	385.8	41.8	71	229	513.4	52.7
54	174	392.4	42.4	72	232	520.0	53.3
55	178	401.2	43 2	73	235	526.6	53.8
56	181	407.8	43.8	74	238	533.2	54.4
57	184	414.4	44.3	75	242	542.0	55.2
58	187	421.0	44.9	76	245	548.6	55.7
59	190	427.6	45.4	77	248	555.2	56.3
60	194	436.4	46.2	78	251	561.8	56.8
61	197	443.0	46.7	79	254	568.4	57.3
62	200	449.6	47.3	80	258	577.2	58.1
63	203	456.2	47.8				

For approximate quantities in inclined Culverts, see special memoranda.

TABLE

Dimensions of Arch Culverts from

HORIZONTAL DIMENSIONS.

SPAN OF CULVERT.	Thickness of Walls at Springing.	Half Width over upper Wings.	Width of Pilaster.	Projection of Pilaster at top.	Thickness of Wings at Upper End, and of Parapet over Arch at Lower End.	Inside Length of Springing course.	Length of Wings, Lower End.	Thickness of wings under steps.	Thickness of Wings below Springing at Ends.	Half width over Arch Lower End.
*e. d.	e. f.	i. l.	m. n.	o. p.	p. r.	s. t.	s. v.	x. w.	d. w.	i. w.
ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
4..0	2..6	11..0	2..3	1..0	4..0	3..0	9..6	2..3	2..6	4..6
5..0	2..9	12..7½	2..4½	1..0½	4..1½	3..1½	10..6	2..6	2..9	5..3
6..0	3..3	14..3	2..6	1..1	4..3	3..3	11..6	2..9	3..0	6..3
8..0	4..0	17..4½	2..9	1..2	4..6	3..6	14..0	3..3	3..6	7..6
10..0	4..8	20..6	3..0	1..3	4..9	3..9	16..6	3..9	4..0	9..0
12..0	5..4	23..9	3..3	1..4	5..0	4..0	19..0	4..3	4..6	10..6
14..0	5..10	27..0	3..9	1..5	5..3	4..3	21..6	4..3	4..6	11..6
16..0	6..4	30..3	4..6	1..6	5..6	4..6	24..0	4..3	4..6	12..6
18..0	6..9	33..6	5..3	1..7	5..9	4..9	26..0	4..3	4..6	13..6
20..0	7..2	36..9	6..0	1..8	6..0	5..0	28..0	4..3	4..6	14..6

* *These letters have reference to corresponding letters in the Diagram.*

BLE G.

from Four to Twenty Feet Span.

			VERTICAL DIMENSIONS.							
Half width over Arch Lower End.	Thickness of Apron, Lower End.	Side of Triangle at rear of Upper Wings.	Thickness of Arch.	Height of Arch.	Height of Bench Walls above Paving.	Thickness of Coping.	Thickness of Course over Arch.	Height of Upper Wings above Paving.	Thickness of Springing Course.	Thickness of Paving.
i. w.	v. y.	f. f_1	a. b.	b. c.	g. h.	i. k.	k. a.	l. m.	d. s.	c. z.
ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
4..6	3..0	0..0	1..4	6..0	6..0	1..3	1..0	9..7	1..0	1..0
5..3	3..1½	0..0	1..5	7..0	7..0	1..3½	1..0½	10..10	1..0	1..1
6..3	3..3	0..0	1..6	8..0	8..0	1..4	1..1	11..11	1..0	1..2
7..6	3..6	2..9	1..7	10..0	10..0	1..5	1..2	14..2	1..0	1..3
9..0	3..9	3..0	1..8	12..0	12..0	1..5	1..2	16..3	1..0	1..4
10..6	4..0	3.3.	1..10	14..0	14..0	1..6	1..3	18..7	1..0	1..5
11..6	4..3	3. 9	2..0	16..0	16..0	1..6	1..3	20..9	1..1	1..6
12..6	4..6	4. 6	2..2	18. 0	18..0	1..7	1..3	23..0	1..2	1..7
13..6	4..9	5..3	2..4	20..0	20..0	1..8	1..3	25..3	1..3	1..8
14..6	5..0	6..0	2..6	22..0	22..0	1..9	1..3	27..6	1..4	1..9

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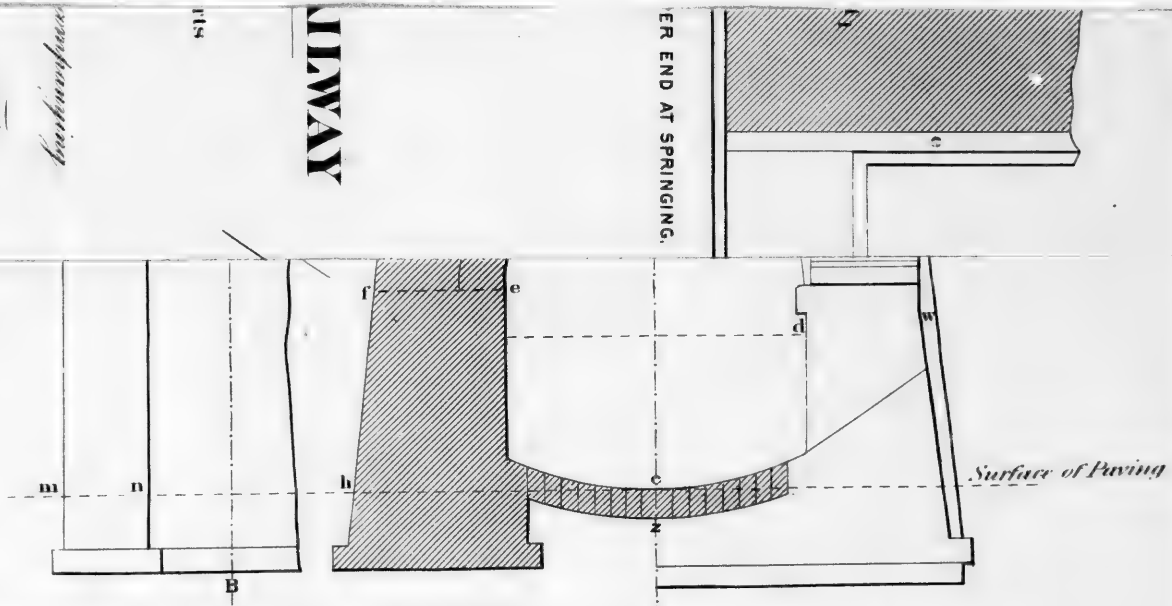
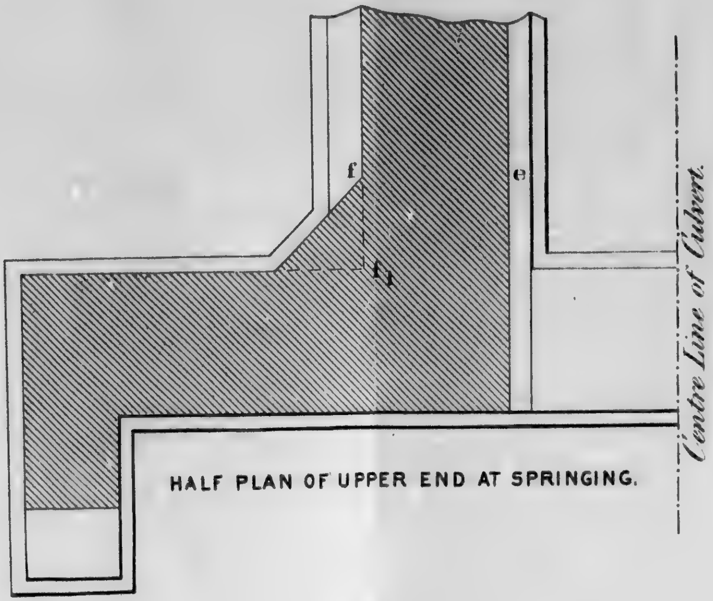
companying

d Fleming,

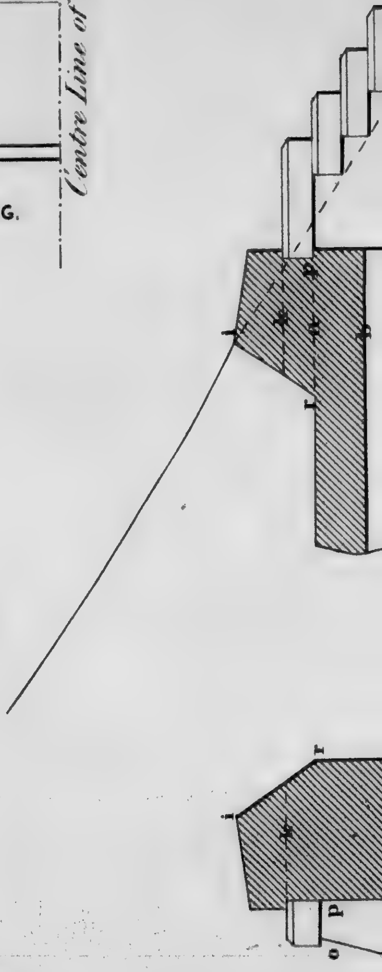
Chief Engin



PART ELEVATION UPPER END. HALF SECTION. HALF ELEVATION LOWER END.



HALF PLAN OF UPPER END AT SPRINGING.



INTERCOLONIAL RAILWAY

DIAGRAM

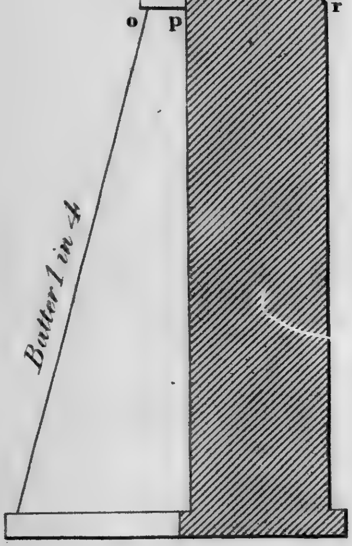
to accompany Tables of Arch Culverts
from 4 to 20 Feet Span.

The letters correspond with those in the accompanying Table of Dimensions.

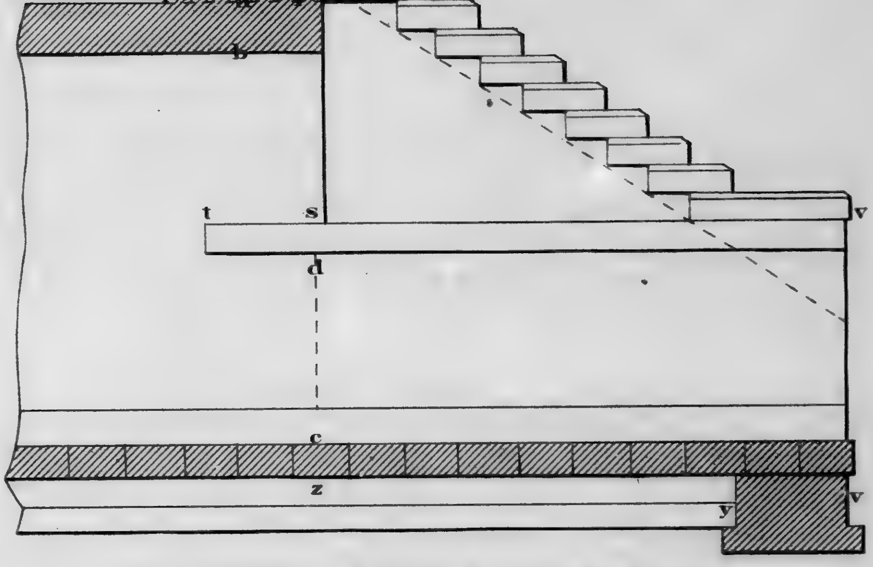
Sandford Fleming,
Chief Engineer.

G

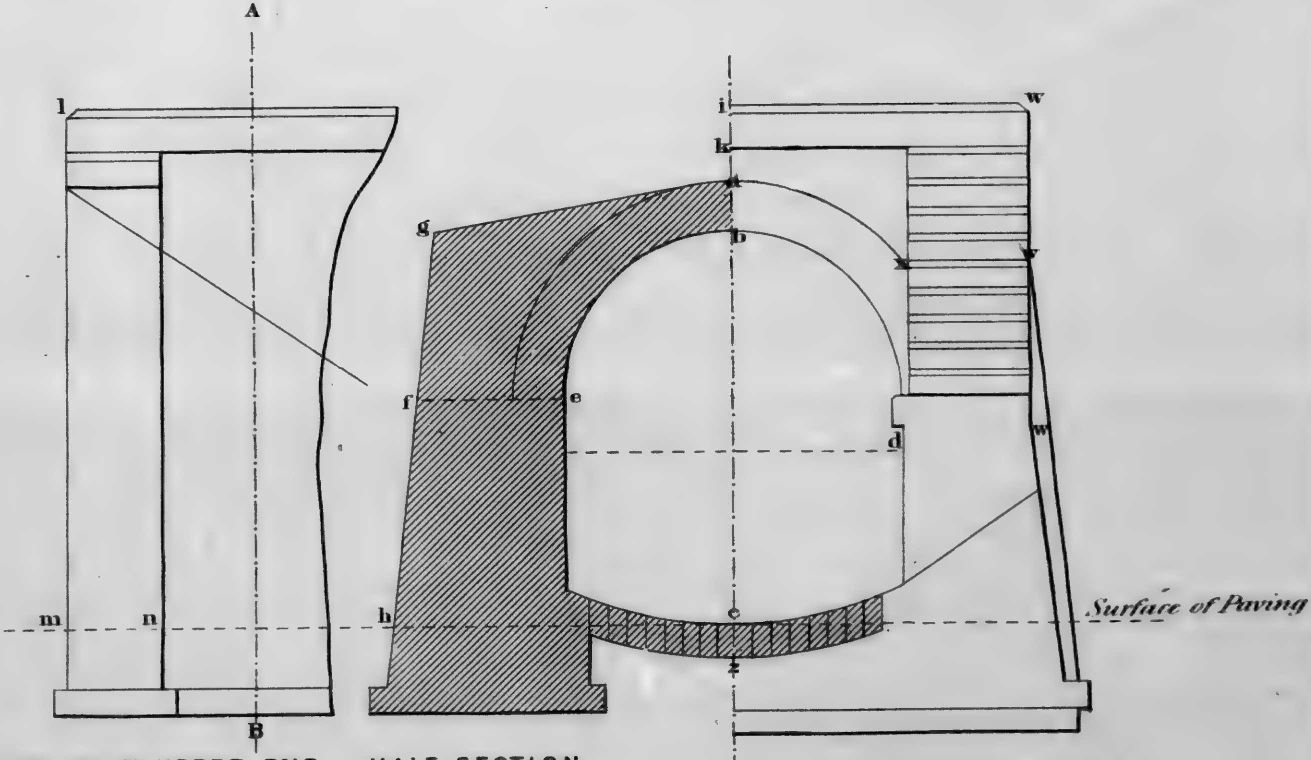
W. J. Forrest del.



SECTION AB.



LONGITUDINAL SECTION AT LOWER END.



PART ELEVATION UPPER END. HALF SECTION.

HALF ELEVATION LOWER END.

TABLE H.

Shewing the half lengths of Arch Culverts (from Centre Line to the end of arch) for every height of Embankment (above paving) up to 80 feet, assuming the Culverts to be on a level—that is to say—without any inclination between the Upper and Lower ends, and also at right angles to the Centre Line of Railway.

* (This Table is supplementary to, and to be used instead of Table A, General Instructions No. 4, for Arch Culverts.—For Box Culverts, see Table A.)

Height of formation level above paving in centre of Culverts.	HALF LENGTHS OF CULVERTS.									
	4 feet.	5 feet.	6 feet.	8 feet.	10 ft.	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
10 feet.	13.0									
11	14.5									
12	16.0									
13	17.5	16.0								
14	19.0	17.5								
15	21.0	19.0	17.5							
16	22.5	20.5	19.0							
17	24.0	22.0	20.5	16.0						
18	25.5	23.5	22.0	17.5						
19	27.0	25.0	23.5	19.0	16.0					
20	29.0	26.5	25.0	20.5	17.5	15.5				
21	30.5	28.0	26.5	22.0	19.0	17.0	13.5			
22	32.0	29.5	28.0	23.5	20.5	18.5	15.0	12.0		
23	33.5	31.0	29.5	25.0	22.0	20.0	16.5	13.5	10.0	
24	35.0	32.5	31.0	26.5	23.5	21.5	18.0	15.0	11.5	
25	37.0	34.5	33.0	28.0	25.0	23.0	19.5	16.5	13.0	10.0
26	38.5	36.0	34.5	29.5	26.5	24.5	21.0	18.0	14.5	11.5
27	40.0	37.5	36.0	31.0	28.0	26.0	22.5	19.5	16.0	13.0
28	41.5	39.0	37.5	33.0	29.5	27.5	24.0	21.0	17.5	14.5
29	43.0	40.5	39.0	34.5	31.0	29.0	25.5	22.5	19.0	16.0
30	45.0	42.5	41.0	36.0	33.0	30.5	27.0	24.0	20.5	17.5

TABLE II.—*Continued.*

Shewing the half lengths of Arch Culverts (from Centre Line to the end of arch) for every height of Embankment (above paving) up to 80 feet, assuming the Culverts to be on a level—that is to say—without any inclination between the Upper and Lower ends, and also at right angles to the Centre Line.

* (This Table is supplementary to, and to be used instead of Table A, General Instructions No. 4, for Arch Culverts.—For Box Culverts, see Table A.)

Height of Formation Level above paving.	HALF LENGTHS OF CULVERTS.									
	4 feet.	5 feet.	6 feet.	8 feet.	10 ft.	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
31	46.5	44.0	42.5	37.5	34.5	32.5	28.5	25.5	22.0	19.0
32	48.0	45.5	44.0	39.0	36.0	34.0	30.5	27.0	23.5	20.5
33	49.5	47.0	45.5	41.0	37.5	35.5	32.0	29.0	25.0	22.0
34	51.0	48.5	47.0	42.5	39.0	37.0	33.5	30.5	27.0	23.5
35	53.0	50.5	49.0	44.0	41.0	38.5	35.0	32.0	28.5	25.5
36	54.5	52.0	50.5	45.5	42.5	40.5	36.5	33.5	30.0	27.0
37	56.0	53.5	52.0	47.0	44.0	42.0	38.5	35.0	31.5	28.5
38	57.5	55.0	53.5	49.0	45.5	43.5	40.0	37.0	33.0	30.0
39	59.0	56.5	55.0	50.5	47.0	45.0	41.5	38.5	35.0	31.5
40	61.0	58.5	57.0	52.0	49.0	46.5	43.0	40.0	36.5	33.5
41	62.5	60.0	58.5	53.5	50.5	48.5	44.5	41.5	38.0	35.0
42	64.0	61.5	60.0	55.0	52.0	50.0	46.5	43.0	39.5	36.5
43	65.5	63.0	61.5	57.0	53.5	51.5	48.0	45.0	41.0	38.0
44	67.0	64.5	63.0	58.5	55.0	53.0	49.5	46.5	43.0	39.5
45	69.0	66.5	65.0	60.0	57.0	54.5	51.0	48.0	44.5	41.5
46	70.5	68.0	66.5	61.5	58.5	56.5	52.5	49.5	46.0	43.0
47	72.0	69.5	68.0	63.0	60.0	58.0	54.5	51.0	47.5	44.5
48	73.5	71.0	69.5	65.0	61.5	59.5	56.0	53.0	49.0	46.0
49	75.0	72.5	71.0	66.5	63.0	61.0	57.5	54.5	51.0	47.5
50	77.0	74.5	73.0	68.0	65.0	62.5	59.0	56.0	52.5	49.5
51	78.5	76.0	74.5	69.5	66.5	64.5	60.5	57.5	54.0	51.0

TABLE H.—*Continued.*

Shewing the half lengths of Arch Culverts (from Centre Line to the end of arch) for every height af Embankment (above paving) up to 80 feet, assuming the Culverts to be on a level—that is to say—without any inclination between the Upper and Lower ends, and also at right angles to the Centre Line of Railway.

*** (This Table is supplementary to, and to be used instead of Table A, General Instructions No. 4, for Arch Culverts.—For Box Culverts, see Table A.)**

Height of Formation Level above paving.	HALF LENGTHS OF CULVERTS.									
	4 feet.	5 feet.	6 feet.	8 feet.	10 ft.	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
52 feet.	80.0	77.5	76.0	71.0	68.0	66.0	62.5	59.0	55.5	52.5
53	81.5	79.0	77.5	73.0	69.5	67.5	64 0	61.0	57.0	54.0
54	83.0	80.5	79.0	74 5	71.0	69.0	65.5	62.5	59.0	55.5
55	85.0	82 5	81.0	76.0	73.0	70.5	67.0	64.0	60.5	57.5
56	86.5	84.0	82.5	77.5	74 5	72.5	68.5	65.5	62.0	59.0
57	88.0	85.5	84.0	79.0	76.0	74.0	70.5	67.0	63.5	60.5
58	89.5	87.0	85.5	81.0	77.5	75.5	72.0	69.0	65.0	62.0
59	91.0	88.5	87.0	82.5	79.0	77.0	73.5	70.5	67.0	63.5
60	93.0	90.5	89.0	84.0	81.0	78.5	75.0	72.0	68.5	65.5
61	94.5	92 0	90.5	85.5	82.5	80.5	76.5	73.5	70.0	67.0
62	96.0	93.5	92.0	87.0	84.0	82.0	78.5	75.0	71.5	68.5
63	97.5	95.0	93.5	89.0	85.5	83.5	80.0	77.0	73.0	70-0
64	99.0	96.5	95.0	90.5	87.0	85.0	81.5	78.5	75.0	71.5
65	101.0	98.5	97.0	92.0	89.0	86.5	83.0	80.0	76.5	73.5
66	102.5	100.0	98.5	93 5	90.5	88.5	84.5	81.5	78.0	75.0
67	104.0	101.5	100.0	95 0	92.0	90.0	86.5	83.0	79.5	76.5
68	105.5	103.0	101.5	97.0	93.5	91.5	88.0	85.0	81.0	78.0
69	107.0	104.5	103.0	98.5	95.0	93.0	89.5	86.5	83.0	79.5
70	109.0	106.5	105.0	100.0	97.0	94.5	91.0	88.0	84.5	81.5
71	110.5	108.0	106.5	101.5	98.5	96.5	92.5	89.5	86.0	83.0
72	112.0	109.5	108.0	103.0	100.0	98.0	94 5	91.0	87.5	84.5

TABLE H.—*Continued.*

Shewing the half lengths of Arch Culverts (from Centre Line to the end of arch) for every height of Embankment (above paving) up to 80 feet, assuming the Culverts to be on a level—that is to say—without any inclination between the Upper and Lower ends, and also at right angles to the Centre Line of Railway.

* (This Table is supplementary to, and to be used instead of Table A, General Instructions No. 4, for Arch Culverts.—For Box Culverts, see Table A.)

Height of Formation Level above paving.	HALF LENGTHS OF CULVERTS.									
	4 feet.	5 feet.	6 feet.	8 feet.	10 ft.	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
73 feet.	113.5	111.0	109.5	105.0	101.5	99.5	96.0	93.0	89.0	86.0
74	115.0	112.5	111.0	106.5	103.0	101.0	97.5	94.5	91.0	87.5
75	117.0	114.5	113.0	108.0	105.0	102.5	99.0	96.0	92.5	89.5
76	118.5	116.0	114.5	109.5	106.5	104.5	100.5	97.5	94.0	91.0
77	120.0	117.5	116.0	111.0	108.0	106.0	102.5	99.0	95.5	92.5
78	121.5	119.0	117.5	113.0	109.5	107.5	104.0	101.0	97.0	94.0
79	123.0	120.5	119.0	114.5	111.0	109.0	105.5	102.5	99.0	95.5
80	125.0	122.5	121.0	116.0	113.0	110.5	107.0	104.0	100.5	97.5

Note.—The line of paving must always be a few inches at least under the lowest point in the natural bed of streams. See General Instructions (No. 3) in reference to this. The height of formation level above line of paving at the intersection of centre line being found in the first column, the half length of Arch of each kind will be seen in the respective columns opposite. The Wings, at least so much as extend beyond the ends of the Arch, are not included in the above half lengths.

TABLE I. (*Level*)—4 Feet Arch Culverts.

This is a Table of quantities in Four Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 4 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert	Masonry,	2.44 cub. yds.	Paving,	0.0926 cub. yds.
Additional for Lower End	Do	25.56 "	Do	0.8800 "
Additional for Upper End	Do	29.82 "	Do	0.6000 "
Do do	Retaining wall		Do	1.5000 "

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
10 feet.	26	118.8	5.4	30 feet.	90	275.0	11.3
11	29	126.1	5.7	31	93	282.3	11.6
12	32	133.5	5.9	32	96	289.6	11.9
13	35	140.8	6.2	33	99	296.9	12.2
14	38	148.1	6.5	34	102	304.2	12.5
15	42	157.9	6.8	35	106	314.0	12.8
16	45	165.2	7.1	36	109	321.3	13.1
17	48	172.5	7.5	37	112	328.6	13.4
18	51	179.8	7.7	38	115	335.9	13.6
19	54	187.1	8.0	39	118	343.2	13.9
20	58	196.9	8.3	40	122	353.0	14.3
21	61	204.2	8.6	41	125	360.4	14.5
22	64	211.5	8.9	42	128	367.7	14.8
23	67	218.8	9.2	43	131	375.0	15.1
24	70	226.2	9.5	44	134	382.3	15.4
25	74	236.0	9.8	45	138	392.1	15.8
26	77	243.3	10.1	46	141	399.4	16.0
27	80	250.6	10.4	47	144	406.7	16.3
28	83	257.9	10.7	48	147	414.0	16.6
29	86	265.2	10.9	49	150	421.3	16.9

TABLE I.—*Continued.*

This is a Table of quantities in Four Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 4 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert.......	Masonry,	2.44 cub. yds.		Paving,	0.0926 cub. yds.	
Additional for Lower End	Do	25.56	"	Do	0.8800	"
Additional for Upper End	Do	29.82	"	Do	0.6000	"
Do do	Retaining wall			Do	1.5000	"

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
50 feet.	154	431.1	17.3	66	205	555.6	22.0
51	157	438.4	17.6	67	208	562.9	22.2
52	160	445.7	17.9	68	211	570.2	22.5
53	163	453.1	18.1	69	214	577.5	22.8
54	166	460.4	18.4	70	218	587.3	23.2
55	170	470.2	18.8	71	221	594.6	23.5
56	173	477.5	19.0	72	224	601.9	23.7
57	176	484.8	19.3	73	227	609.2	24.0
58	179	492.1	19.6	74	230	616.5	24.3
59	182	499.4	19.9	75	234	626.3	24.7
60	186	509.2	20.3	76	237	633.6	24.9
61	189	516.5	20.5	77	240	641.0	25.2
62	192	523.8	20.8	78	243	648.3	25.5
63	195	531.2	21 0	79	246	655.6	25.8
64	198	538.5	21.3	80	250	665.4	26.1
65	202	548.3	21.7				

For approximate quantities in inclined Culverts, see special memoranda.

TABLE K. (*Level*)—5 Feet Arch Culverts.

This is a Table of quantities in Five Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 5 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert..................Masonry, 2 92 cub. yds. Paving, 0.135 cub. yds.
Additional for Lower End............ Do 35.02 " Do 1.420 "
Additional for Upper End............ Do 37.35 " Do .966 "
Do do ....Retaining wall............ Do 1.800 "

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
13 feet.	32	165.8	8.5	32 feet.	91	338.1	16.5
14	35	174.6	8.9	33	94	346.8	16.8
15	38	183.3	9.3	34	97	355.6	17.3
16	41	192.1	9.7	35	101	367.3	17.8
17	44	200.9	10.1	36	104	376.0	18.2
18	47	209.6	10.5	37	107	384.8	18.6
19	50	218.4	10.9	38	110	393.6	19.0
20	53	227.1	11.3	39	113	402.3	19.4
21	56	235.9	11.7	40	117	414.0	20.0
22	59	244.6	12.1	41	120	422 8	20.4
23	62	253.4	12.5	42	123	431.5	20.8
24	65	262.2	13.0	43	126	410.3	21.2
25	69	273.9	13.5	44	129	449.0	21.6
26	72	282.6	13.9	45	133	460.7	22.1
27	75	291.4	14.3	46	136	469.5	22.5
28	78	300.1	14.7	47	139	478.2	22.9
29	81	308.9	15.1	43	142	487.0	23.3
30	85	320.6	15.6	49	145	495.8	23.8
31	88	329.3	16.0	50	149	507.5	24.3

TABLE K.—*Continued.*

This is a Table of quantities in Five Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 5 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert………………Masonry, 2.92 cub. yds. Paving, 0.135 cub. yds.
Additional for Lower End………… Do 35.02 " Do 1.420 "
Additional for Upper End…… …… Do 37.35 " Do .966 "
Do do ……………Retaining Wall………… Do 1.800 "

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
51feet.	152	516.2	24.7	66feet.	200	656.4	31.1
52	155	524.9	25.1	67	203	665.1	31.6
53	158	533.7	25.5	68	206	673.9	32.0
54	161	542.5	25.9	69	209	682.6	32.4
55	165	554.2	26.4	70	213	694.3	32.9
56	168	562.9	26.8	71	216	703.1	33.3
57	171	571.7	27.3	72	219	711.8	33.7
58	174	580.4	27.7	73	222	720.6	34.1
59	177	589.2	28.1	74	225	729.4	34.6
60	181	600.9	28.6	75	229	741.1	35.1
61	184	609.6	29.0	76	232	749.8	35.5
62	187	618.4	29.4	77	235	758.6	35.9
63	190	627.2	29.8	78	238	767.3	36.3
64	193	635.9	30.2	79	241	776.1	36.7
65	197	647.6	30.7	80	245	787.8	37.2

For approximate quantities in inclined Culverts, see special memoranda.

TABLE L. (*Level*)—6 Feet Arch Culverts.

This is a Table of quantities in six Feet Arch, Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 6 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert..... ....Masonry, 3.68 cub. yds. Paving, 0.194 cub. yds.
Additional for Lower End............... Do 44.57 " Do 2.236 "
Additional for Upper End............... Do 47.00 " Do 1.555 "
Do do .... Retaining wall .. .. Do 2.600 "

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
15 feet.	35	220.3	13.2	34 feet.	94	437.5	24.6
16	38	231.4	13.7	35	98	452.2	25.4
17	41	242.4	14.3	36	101	463.2	26.0
18	44	253.5	14.9	37	104	474.3	26.5
19	47	264.5	15.5	38	107	485.3	27.1
20	50	275.6	16.1	39	110	496.4	27.7
21	53	286.6	16.7	40	114	511.1	28.5
22	56	297.6	17.2	41	117	522.1	29.1
23	59	308.7	17.8	42	120	533.2	29.7
24	62	319.7	18.4	43	123	544.2	30.3
25	66	334.4	19.2	44	126	555.3	30.8
26	69	345.5	19.8	45	130	570.0	31.6
27	72	356.5	20.4	46	135	581.0	32.2
28	75	367.6	20.9	47	136	592.0	32.7
29	78	378.6	21.5	48	139	603.1	33.3
30	82	393.3	22.3	49	142	614.1	33.9
31	85	404.4	22.9	50	146	628.8	34.7
32	88	415.4	23.5	51	149	639.9	35.3
33	91	426.4	24.0	52	152	650.9	35.9

TABLE L.—*Continued.*

This is a Table of quantities in Six Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 6 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert....... ....Masonry, 3.68 cub. yds. Paving, 0.194 cub. yds.
Additional for Lower End .... Do 44.57 " Do 2.236 "
Additional for Upper End .... Do 47.00 " Do 1.555 "
Do do ....Retaining wall .... Do 2.600 "

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
53 feet.	155	662.0	36.5	67 feet	200	827.6	45.2
54	158	673.0	37.0	68	203	838.6	45.8
55	162	687.7	37.8	69	206	849.6	46.4
56	165	698.7	38.4	70	210	864.4	47.2
57	168	709.8	38.9	71	213	875.4	47.7
58	171	720.8	39.5	72	216	886.4	48.3
59	174	731.9	40.1	73	219	897.5	48.9
60	178	746 6	40.9	74	222	908.5	49.4
61	181	757.6	41.5	75	226	923.2	50.2
62	184	768.7	42.1	76	229	934.3	50.8
63	187	779.7	42.7	77	232	945.3	51.4
64	190	790.7	43.2	78	235	956.4	52.0
65	194	805.5	44.0	79	238	967.4	52.6
66	197	816.5	44.6	80	242	982.1	53.4

For approximate quantities in inclined Culverts, see special memoranda.

TABLE M. (*Level*)—8 Feet Arch Culverts.

This is a Table of quantities in Eight Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 8 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert	Masonry,	5.18 cub. yds.	Paving,	0.301 cub. yds.
Additional for Lower End	Do	67.95 "	Do	4.213 "
Additional for Upper End	Do	75.00 "	Do	3.000 "
Do do	Retaining wall		Do	4.000 "

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
17 feet.	32	308.7	20.8	36 feet.	91	614.3	38.6
18	35	324.2	21.7	37	94	629.8	39.5
19	38	339.8	22.6	38	98	650.6	40.7
20	41	355.3	23.5	39	101	666.1	41.6
21	44	370.8	24.4	40	104	681.7	42.5
22	47	386.4	25.3	41	107	697.2	43.4
23	50	401.9	26.2	42	110	712.7	44.3
24	53	417.5	27.1	43	114	733.5	45.5
25	56	433.0	28.0	44	117	749.0	46.4
26	59	448.5	28.9	45	120	764.5	47.3
27	62	464.0	29.8	46	123	780.1	48.2
28	66	484.8	31.0	47	126	795.6	49.1
29	69	500.4	31.9	48	130	816.3	50.3
30	72	515.9	32.8	49	133	821.9	51.2
31	75	531.4	33.7	50	136	847.4	52.1
32	78	547.0	34.7	51	139	863.0	53.0
33	82	567.7	35.9	52	142	878.5	54.0
34	85	583.2	36.8	53	146	899.2	55.2
35	88	598.8	37.7	54	149	914.7	56.1

TABLE M.—*Continued.*

This is a Table of quantities in Eight Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 8 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert..................	Masonry,	5.18	cub. yds.	Paving,	0.301	cub. yds.
Additional for Lower End.............	Do	67.95	"	Do	4.213	"
Additional for Upper End......	Do	75.00	"	Do	3.000	"
Do do	Retaining Wall............			Do	4.000	"

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY.—Cubic yards.	PAVING.—Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY.—Cubic yards.	PAVING.—Cubic yards.
55 feet.	152	930.3	57.0	68 feet.	194	1147.8	69.6
56	155	945.8	57.9	69	197	1163.4	70.5
57	158	961.4	58.8	70	200	1179.0	71.4
58	162	982.1	60.0	71	203	1194.5	72.3
59	165	997.6	60.9	72	206	1210.0	73.2
60	168	1013.2	61.8	73	210	1230.7	74.4
61	171	1028.7	62.7	74	213	1246.3	75.3
62	174	1044.2	63.6	75	216	1261.8	76.2
63	178	1065.0	64.8	76	219	1277.4	77.1
64	181	1080.5	65.7	77	222	1292.9	78.0
65	184	1096.1	66.6	78	226	1313.6	79.2
66	187	1111.6	67.5	79	229	1329.1	80.1
67	190	1127.1	68.4	80	232	1344.7	81.0

For approximate quantities in inclined Culverts, see special memoranda.

TABLE N. (*Level*)—10 Feet Arch Culverts.

This is a Table of quantities in Ten Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 10 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert....	Masonry,	6.82 cub. yds.	Paving,	0.420 cub. yds.	
Additional for Lower End.............	Do	96.31 "	Do	7.000 "	
Additional for Upper End.............	Do	102.60 "	Do	4.940 "	
Do do	Retaining wall		Do	6.800 "	

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
19 feet.	32	417.1	32.2	38 feet.	91	819.5	57.0
20	35	437.6	33.4	39	94	840.0	58.2
21	38	458.1	34.7	40	98	867.3	59.9
22	41	478.5	36.0	41	101	887.7	61.2
23	44	499.0	37.2	42	104	908.2	62.4
24	47	519.4	38.5	43	107	928.6	63.7
25	50	539.9	39.7	44	110	949.1	64.9
26	53	560.4	41.0	45	114	976.4	66.6
27	56	580.8	42.2	46	117	996.8	67.9
28	59	601.3	43.5	47	120	1017.3	69.1
29	62	621.7	44.8	48	123	1037.8	70.4
30	66	649.0	46.4	49	126	1058.2	71.7
31	69	669.5	47.7	50	130	1085.5	73.4
32	72	690.0	49.0	51	133	1106.0	74.6
33	75	710.4	50.2	52	136	1126.4	75.9
34	78	730.9	51.5	53	139	1146.9	77.1
35	82	758.1	53.2	54	142	1167.3	78.4
36	85	778.6	54.4	55	146	1194.6	80.0
37	88	799.1	55.7	56	149	1215.1	81.3

TABLE N.—*Continued.*

This is a Table of quantities in Ten Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 10 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert	Masonry,	6.82 cub. yds.	Paving,	0.420 cub. yds.
Additional for Lower End	Do	96.31 "	Do	7.000 "
Additional for Upper End	Do	102.60 "	Do	4.940 "
Do do	Retaining wall		Do	6.800 "

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
57 feet.	152	1235.5	82.6	69	190	1494.7	98.5
58	155	1256.0	83.9	70	194	1522.0	100.2
59	158	1276.4	85.1	71	197	1542.4	101.5
60	162	1303.7	86.8	72	200	1562.9	102.7
61	165	1324.2	88.0	73	203	1583.4	104.0
62	168	1344.7	89.3	74	206	1603.8	105.3
63	171	1365.1	90.5	75	210	1631.1	106.9
64	174	1385.6	91.8	76	213	1651.6	108.2
65	178	1412.9	93.5	77	216	1672.0	109.5
66	181	1433.3	94.8	78	219	1692.5	110.7
67	184	1453.8	96.0	79	222	1713.0	112.0
68	187	1474.2	97.3	80	226	1740.3	113.7

For approximate quantities in inclined Culverts, see special memoranda.

TABLE O. (*Level*)—12 Feet Arch Culverts.

This is a Table of quantities in Twelve Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 12 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert....	Masonry,	8.50 cub. yds.	Paving,	0.551	cub. yds.
Additional for Lower End	Do	136.70 "	Do	10.470	"
Additional for Upper End...........	Do	147.18 "	Do	7.555	"
Do do	Retaining wall...........		Do	9.800	"

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
20 feet.	31	547.4	44.9	39 feet.	90	1048.9	77.4
21	34	572.9	46.5	40	93	1074.4	79.0
22	37	598.4	48.2	41	97	1108.4	81.3
23	40	623.9	49.8	42	100	1133.9	82.9
24	43	649.4	51.5	43	103	1159.4	84.5
25	46	674.9	52.2	44	106	1184.9	86.2
26	49	700.4	54.8	45	109	1210.4	88.9
27	52	725.9	56.5	46	113	1244.4	90.1
28	55	751.4	58.1	47	116	1269.9	91.7
29	58	776.9	59.8	48	119	1295.4	93.8
30	61	802.4	66.4	49	122	1320.9	95.0
31	65	836.4	63.6	50	125	1346.4	96.6
32	68	861.9	65.3	51	129	1380.4	88.9
33	71	887.4	66.9	52	132	1405.9	100.5
34	74	912.9	68.6	53	135	1431.4	101.2
35	77	938.4	70.2	54	138	1456.9	103.8
36	81	972.4	72.4	55	141	1482.4	105.5
37	84	997.9	74.1	56	145	1516.4	107.7
38	87	1023.4	75.9	57	148	1541.9	109.3

TABLE O.—*Continued.*

This is a Table of quantities in Twelve Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 12 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert.........................Masonry, 8.50 cub. yds. Paving, 0.551 cub. yds.
Additional for Lower End................ Do 136.70 " Do 10.470 "
Additional for Upper End...... .... Do 147.18 " Do 7.555 "
Do do ....Retaining Wall............ Do 9.800 "

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
58 feet.	151	1567.4	111.0	70	189	1890.4	132.0
59	154	1592.9	112.7	71	193	1924.4	134.2
60	157	1618.4	114.3	72	196	1949.9	135.8
61	161	1652.4	116.5	73	199	1975.4	137.5
62	164	1677.9	118.2	74	202	2000.9	138.2
63	167	1703.4	119.8	75	205	2026.4	140.8
64	170	1728.9	121.5	76	209	2060.4	143.0
65	173	1754.4	123.1	77	212	2085.9	144.6
66	177	1788.4	125.3	78	215	2111.4	146.3
67	180	1813.9	127.0	79	218	2136.9	147.9
68	183	1839.4	128.6	80	221	2162.4	149.6
69	186	1864.9	130.3				

For approximate quantities in inclined Culverts, see special memoranda.

TABLE P. *(Level)*—14 Feet Arch Culverts.

This is a Table of quantities in Fourteen Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 14 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert.......	.......Masonry,	9.74 cub. yds.	Paving,	0.70 cub. yds.	
Additional for Lower End	Do	168.41	"	Do 14.93	"
Additional for Upper End	Do	188.46	"	Do 10.88	"
Do do	...........Retaining wall			Do 13.40	"

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
21 feet.	27	619.8	58.1	40 feet.	86	1194.5	99.4
22	30	649.1	60.2	41	89	1223.7	101.5
23	33	678.3	62.3	42	93	1262.7	104.3
24	36	707.5	64.4	43	96	1291.9	106.4
25	39	736.7	66.5	44	99	1321.1	108.5
26	42	765.9	68.6	45	102	1350.3	110.6
27	45	795.2	70.7	46	105	1379.6	112.7
28	48	824.4	72.8	47	109	1418.5	115.5
29	51	853.6	74.9	48	112	1447.7	117.6
30	54	882.8	77.0	49	115	1477.0	119.7
31	57	912.0	79.1	50	118	1506.2	121.8
32	61	951.0	81.9	51	121	1535.5	123.9
33	64	980.2	84.0	52	125	1574.4	126.7
34	67	1009.4	86.1	53	128	1603.6	128.8
35	70	1038.6	88.2	54	131	1632.8	130.9
36	73	1067.9	90.3	55	134	1662.0	133.0
37	77	1106.8	93.1	56	137	1691.2	135.1
38	80	1136.1	95.2	57	141	1730.2	137.9
39	83	1165.3	97.3	58	144	1759.4	140.0

TABLE P.—*Continued.*

This is a Table of quantities in Fourteen Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the w' le structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 14 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert.......	.......Masonry,	9.74 cub. yds.	Paving,	0.70 cub. yds.
Additional for Lower End	Do	168.41 "	Do	14.93 "
Additional for Upper End	Do	188.46 "	Do	10.88 "
Do do	...........Retaining wall		Do	13.40 "

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
59 feet.	147	1788.6	142.1	70 feet.	182	2129.5	166.6
60	150	1817.8	144.2	71	185	2158.8	168.7
61	153	1847.1	146.3	72	189	97.7	171.5
62	157	1886.1	149.1	73	192	26.9	173.6
63	160	1915.3	151.2	74	195	2256 2	175.7
64	163	1944.5	153.3	75	198	2285.4	177.8
65	166	1973.7	155.4	76	201	2314.6	179.9
66	169	2002.9	157-5	77	205	2353.6	182.7
67	173	2041.9	160.3	78	208	2382.8	184.8
68	176	2071.1	162.4	79	211	2412.0	186.9
69	179	2100.3	164.5	80	214	2441.2	189.0

For approximate quantities in inclined Culverts, see spec'al memoranda.

TABLE Q. *(Level)*—16 Feet Arch Culverts.

This is a Table of quantities in Sixteen Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 16 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert	Masonry,	11.63	cub. yds.	Paving,	0.850	cub. yds.
Additional for Lower End	Do	204.00	"	Do	20.400	"
Additional for Upper End	Do	249.50	"	Do	15.000	"
Do do	Retaining wall			Do	18.760	"

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
22 feet.	24	732.6	74.5	41 feet.	83	1418.8	124.6
23	27	767.5	77.0	42	86	1453.7	127.2
24	30	802.4	79.6	43	90	1500.2	130.6
25	33	837.3	82.1	44	93	1535.1	133.1
26	36	872.2	84.7	45	96	1570.0	135.7
27	39	907.1	87.3	46	99	1604.9	138.3
28	42	942.0	89.8	47	102	1639.8	140.8
29	45	976.9	92.4	48	106	1686.3	144.2
30	48	1011.8	94.9	49	109	1721.2	146.7
31	51	1046.7	97.4	50	112	1756.1	149.3
32	54	1081.5	100.0	51	115	1791.0	151.8
33	58	1128.0	103.4	52	118	1825.9	154.4
34	61	1162.9	106.9	53	122	1872.4	157.8
35	64	1197.8	108.5	54	125	1907.3	160.4
36	67	1232.7	111.0	55	128	1942.2	162.9
37	70	1267.6	113.6	56	131	1977.1	165.5
38	74	1314.1	117.0	57	134	2012.0	168.0
39	77	1349.0	119.6	58	138	2058.5	171.4
40	80	1383.9	122.1	59	141	2093.4	174.0

TABLE Q.—*Continued.*

This is a Table of quantities in Sixteen Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 16 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert	Masonry,	11.63 cub. yds.		Paving,	0.850 cub. yds.	
Additional for Lower End	Do	204 00	"	Do	20.400	"
Additional for Upper End	Do	249.50	"	Do	15.000	"
Do do	Retaining wall			Do	18.700	"

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
60	144	2128.3	176.5
61	147	2163.2	179.1
62	150	2198.1	181.6
63	154	2244.6	185.0
64	157	2279.5	187.6
65	160	2314.4	190.1
66	163	2349.3	192.6
67	166	2384.2	195.2
68	170	2430.7	198.6
69	173	2465.5	201.2
70	176	2500.4	203.7
71	179	2535.3	206.3
72	182	2570.2	208.8
73	186	2616.7	212.2
74	189	2651.6	214.8
75	192	2686.5	217.3
76	195	2721.4	219.9
77	198	2756.3	222.4
78	202	2802.8	225.8
79	205	2837.7	228.4
80	208	2872.6	230.9

For approximate quantities in inclined Culverts, see special memoranda.

TABLE R. (*Level*)—18 Feet Arch Culverts.

This is a Table of quantities in Eighteen Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 18 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert..................Masonry, 14.18 cub. yds. Paving, 1.00 cub. yds.
Additional for Lower End............ Do 251.13 " Do 26.50 "
Additional for Upper End............ Do 312.84 " Do 20.00 "
Do do ....Retaining wall............ Do 23.30 "

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
23 feet.	20	847.6	90.3	42 feet.	79	1684.2	149.3
24	23	890.1	93.3	43	82	1726.7	152.3
25	26	932.6	96.3	44	86	1783.4	156.3
26	29	975.2	99.3	45	89	1826.0	159.3
27	32	1017.7	102.3	46	92	1868.5	162.3
28	35	1060.3	105.3	47	95	1911.1	165.3
29	38	1102.8	108.3	48	98	1953.6	168.3
30	41	1145.3	111.3	49	102	2010.3	172.3
31	44	1187.9	114.3	50	105	2052.9	175.3
32	47	1230.4	117.3	51	108	2095.4	178.3
33	50	1272.9	120.3	52	111	2137.9	181.3
34	54	1329.7	124.3	53	114	2180.5	184.3
35	57	1372.2	127.3	54	118	2237.2	188.3
36	60	1414.7	130.3	55	121	2279.7	191.3
37	63	1457.3	133.3	56	124	2322.3	194.3
38	66	1499.8	136.3	57	127	2364.8	197.3
39	70	1556.6	140.3	58	130	2407.4	200.3
40	73	1599.1	143.3	59	134	2464.1	204.3
41	76	1641.6	146.3	60	137	2506.6	207.3

TABLE R.—*Continued.*

This is a Table of quantities in Eighteen Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 18 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert..............	Masonry,	14.18 cub. yds.	Paving,	1.00	cub. yds.
Additional for Lower End............	Do	251.13 "	Do	26.50	"
Additional for Upper End...........	Do	312.84 "	Do	20.00	"
Do do	Retaining wall...........		Do	23.80	"

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
61 feet.	140	2549.1	210.3	71	172	3002.9	242.3
62	143	2591.7	213.3	72	175	3045.5	245.3
63	146	2634.2	216.3	73	178	3088.0	248.3
64	150	2691.0	220.3	74	182	3144.7	252.3
65	153	2733.5	223.3	75	185	3187.3	255.3
66	156	2776.0	226.3	76	188	3229.8	258.3
67	159	2818.6	229.3	77	190	3272.3	261.3
68	162	2861.1	232.3	78	194	3314.9	264.3
69	166	2917.8	236.3	79	198	3371.6	268.3
70	169	2960.4	239.3	80	201	3414.1	271.3

For approximate quantities in inclined Culverts, see special memoranda.

TABLE S. (*Level*)—20 Feet Arch Culverts.

This is a Table of quantities in Twenty Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 20 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert	Masonry,	17.48	cub. yds.	Paving,	1.200	cub. yds.
Additional for Lower End	Do	292.50	"	Do	33.570	"
Additional for Upper End	Do	397.81	"	Do	26.000	"
Do do	Retaining wall			Do	29.600	"

Height of Formation Level above Surface of Paving.	Length of Arch	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
25 feet.	20	1039 9	113.2	44 feet.	79	2071.2	184.0
26	23	1092.3	116.8	45	83	2141.1	188 8
27	26	1144.8	120.4	46	86	2193.6	192.4
28	29	1197.2	124.0	47	89	2246.0	196.0
29	32	1249.7	127.6	48	92	2298.4	199.6
30	35	1302.1	131.2	49	95	2350.9	203.2
31	38	1354.5	134.8	50	99	2420.8	208.0
32	41	1407.0	138.4	51	102	2473.3	211.6
33	44	1459.4	142.0	52	105	2525.7	215.2
34	47	1511.9	145.6	53	108	2578.1	218.8
35	51	1581.8	150.4	54	111	2630.6	222.4
36	54	1634.2	154.0	55	115	2700.5	227.2
37	57	1686.6	157.6	56	118	2753.0	230.8
38	60	1739.1	161.2	57	121	2805.4	234.4
39	63	1791.5	164.8	58	124	2857.8	238.0
40	67	1861.4	169 6	59	127	2910.2	241.6
41	70	1913.9	173.2	60	131	2980.2	246.4
42	73	1966.3	176.8	61	134	3032.6	250.0
43	76	2018.8	180.4	62	137	3085.1	253.6

TABLE S.—*Continued.*

This is a Table of quantities in Twenty Feet Arch Culverts, according to the accompanying Diagram and Dimensions given in Table G. The Masonry is calculated to a depth of 3 feet under surface of Paving. The height of formation level above surface on centre line being known, the quantities of Masonry and Paving in the whole structure will be found opposite. Paving is supposed to extend from the extremities of wings at lower end, to 20 feet beyond the upper end, and includes retaining walls at foot of slopes.

Per foot run of Culvert..... ....Masonry, 17.48 cub. yds. Paving, 1.200 cub. yds.
Additional for Lower End.............. Do 292.50 " Do 23.570 "
Additional for Upper End.............. Do 397.81 " Do 26.000 "
Do do ....Retaining wall.. .... Do 29.600 "

Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.	Height of Formation Level above Surface of Paving.	Length of Arch.	MASONRY. — Cubic yards.	PAVING. — Cubic yards.
63 feet.	140	3137.5	257.2	72 feet.	169	3644.4	292.0
64	143	3189.9	260.8	73	172	3696.9	295.6
65	147	3259.9	265.6	74	175	3749.3	299.2
66	150	3312.3	269.2	75	179	3819.2	304.0
67	153	3364.7	272.8	76	182	3871.7	307.6
68	156	3417.2	276.4	77	185	3924.1	311.2
69	159	3469.6	280.0	78	188	3976 5	314.8
70	163	3539.5	284.8	79	191	4029.0	318.4
71	166	3592.0	288.4	80	195	4098.9	323.2

For approximate quantities in inclined Culverts, see special memoranda.

TABLE T.

EXPLANATIONS AND REFERENCES.

This is a Table of Quantities in the several kinds of open structures which will require to be employed when the embankments are not sufficiently high to admit Arch Culverts. The first column at the left hand is for the height of formation level above the surface of paving in the middle of the stream.

Columns No. 1, *give the quantities in small Beam Culverts according to* Sheet No. 4, General Lithographed Drawings.

Columns No. 2 *give the quantities in large Beam Culverts according to* Sheet No. 11, General Lithographed Drawings, *from* 5 *to* 14 *feet high, above which height this design will not be employed.*

Columns No. 3 *give the quantities in Beam Bridges of* 20 *feet clear span according to* Sheet No. 11, General Lithographed Drawings, *in which this structure is designated* "24 *feet Beam Bridge." The quantities of Paving are calculated to a span of* 20 *feet. In calculating the quantities of Masonry for these Bridges, the walls are increased in thickness according to the height, as shown in the accompanying diagram. The quantities in this structure are given up to a height of* 21 *feet; but the structure next described becomes more economical, as will be seen, at a lower elevation, and is preferred.*

Columns No. 4 *give the quantities in Bridges of* 20 *feet span according to the special drawing accompanying this Table, and for heights of from* 16 *to* 25 *feet. Retaining walls extending from each angle of the abutments, as shewn in the diagram, are included in the quantities of paving.*

**a.* In small Beam Culverts the Paving is assumed to extend 5 feet beyond the end of the abutments, and the Pitching of the bottoms of the slopes is taken to extend as follows, for each height of Bank, viz :—for 2 feet Bank, 3 feet,—for 3 feet Bank, 4·5 feet,—for 4 feet Bank, 6 feet,—and for 5 feet Bank, 7·5 feet.

**b.* In large Beam Culverts the Paving is assumed to extend 5 feet beyond the ends of the wing walls, and the retaining walls 9 feet beyond the same points. The quantities given in the Table are calculated according to the Drawing, (Sheet No. 11), and should any variation in the span be made, allowance must be made therefor in the amount of paving at the following rates :—for Culverts in 5 feet Bank, 0·94 c. yds. per foot of span,—in 6 feet Bank, 1·05 per foot of span,—in 7 feet Bank, 1·20 per foot,—in 8 feet Bank, 1·36 per foot,—in 9 feet Bank, 1·52 per foot,—in 10 feet Bank, 1,68 per foot,—in 11 feet Bank, 1·83 per foot,—in 12 feet Bank, 2·00 per foot,—in 13 feet Bank, 2·19 per foot,—and in 14 feet Bank, 3·42 per foot.

**c.* In Beam Bridges the Paving is calculated as extending 10 feet outside of the opening, and the Pitching is assumed to be of the following lengths, according to the heights of the embankments, viz :—for 5 feet, 11 feet,—for 6 feet, 13 feet,—for 7 feet, 15 feet,—for 8 feet, 17 feet,—for 9 feet, 19 feet,—10 feet, 21 feet,—for 11 feet 23 feet,—for 12 feet, 25 feet,—for 13 feet 26 feet,—for 14 feet, 28 feet,—for 15 feet, 30 feet,—for 16 feet, 32 feet,—for 17 feet, 34 feet,—for 18 feet, 35 feet,—for 19 feet, 36 feet, for 20 feet, 38 feet,—and 21 feet, 40 feet. Allowance must be made in the quantities of paving, in the event of any variation in the span at the rate of 2·46 cubic yards per foot of span.

**d.* In Beam Bridges, according to the Diagram attached to this Table, the paving is assumed to extend 10 feet outside the opening and retaining walls were calculated as extending from 25 feet for the 16 feet Bank to 31 feet 9 inches for the 25 feet Bank, increasing uniformly in length by 9 inches for each foot in height of Bank. Allowance must be made in the quantities of paving at the rate of 2·46 cubic yards for each foot of span, in the event of larger or smaller openings being deemed advisable.

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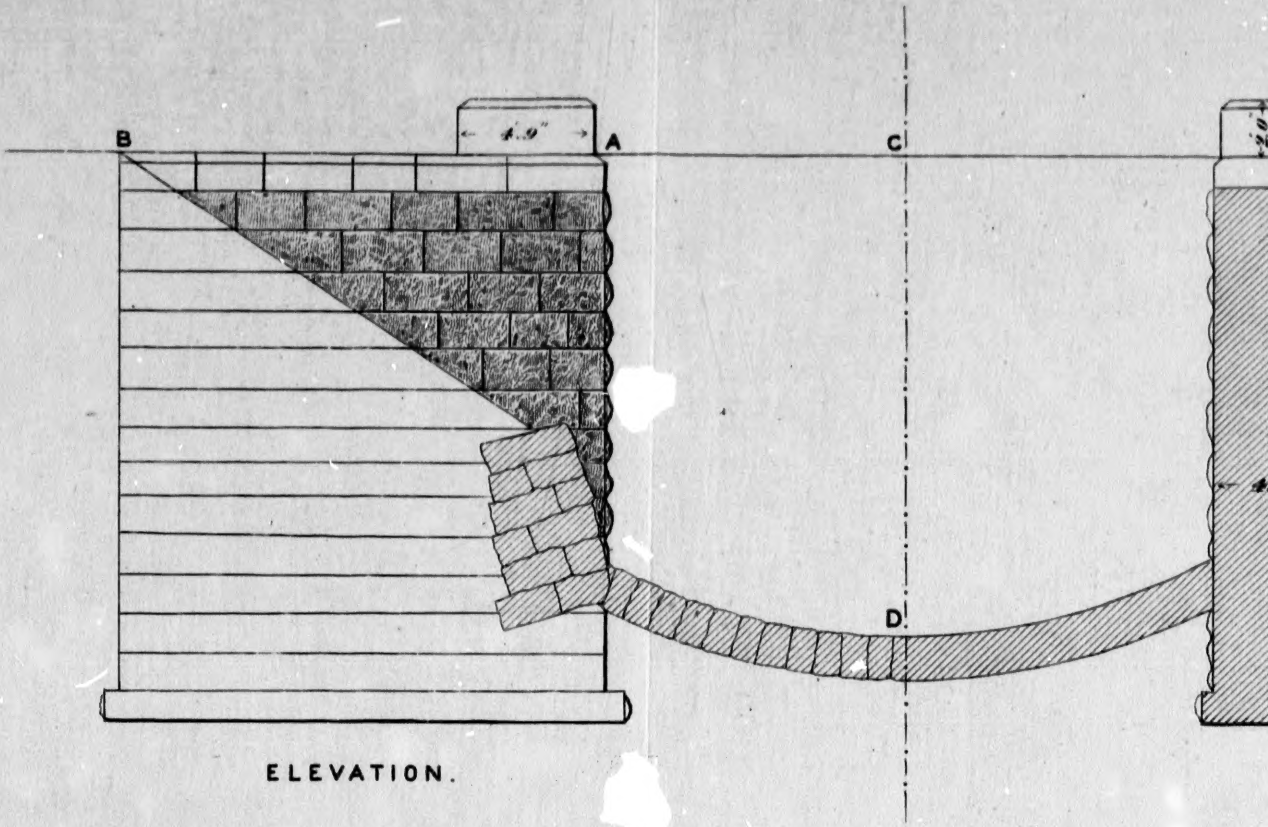
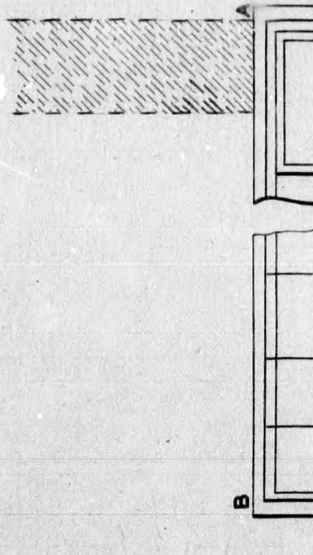
TABLE T.

Height of Formation Level above surface of Paving.	SHEET No. 4. (General Plans.)		SHEET No. 11, (General Plans.				DIAGRAM ATTACHED.	
	Small Beam Culverts.		Large Beam Culverts.		Beam Bridge.		Beam Bridge.	
	Masonry.	*a Paving.	Masonry.	*b Paving and Retaining Walls.	Masonry	*c Paving and Retaining Walls.	Masonry	*d Paving and Retaining Walls.
Feet.	Cub. yds.	Cu. yds.	Cub. yds.		Cu. yds.		Cu. yds.	
	1		2		3		4	
2	27.4	6.5	Second Class Masonry.		Second Class Masonry.		Second Class Masonry.	
3	33.1	7.0						
4	39.0	7.5						
5	44.9	8.1	57.2	21.9	59.5	57.8		
6	Second Class Masonry.		72.0	22.7	68.2	60.9		
7			87.8	24.1	79.3	64.0		
8			104.6	25.3	92.8	67.1		
9			122.4	26.5	108.8	70.2		
10			141.2	27.7	127.4	73.3		
11	....	....	161.1	28.8	148.7	76.4		
12	....	....	182.1	30.0	173.6	79.5		
13	....	....	204.2	30.8	200.7	81.1		
14	....	....	227.4	31.8	230.9	84.2		
15	....	....	....	......	264.4	87.3		
16	....	....	....	......	301.4	90.4	319.6	102.5
	Quantities	of Maso	nry given	under				
17	....	....	....	......	342.1	93.5	354.6	103.8
	and to the	left of	the dark	lines in				
18	....	....	....	......	386.6	95.1	391.4	105.1
	this Table	to be Fir	st Class M	asonry.				
19	....	....	....	......	435.4	96.6	429.9	106.4
20	....	....	....	......	488.2	99.7	470.3	107.8
21	....	....	....	......	545.4	102.8	512.4	109.1
22	....	....	....	......	......	......	556.4	110.5
23	....	....	....	......	......	......	602.0	111.8
24	....	....	....	......	......	......	649.5	113.2
25	....	....	....	......	......	......	698.9	114.5



ELEVATION.



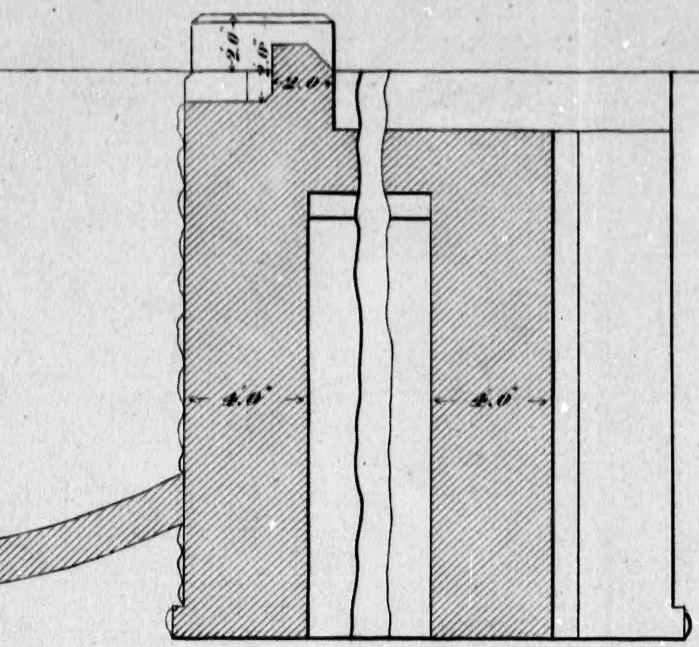
INTERCOLONIAL RAILWAY

DIAGRAM

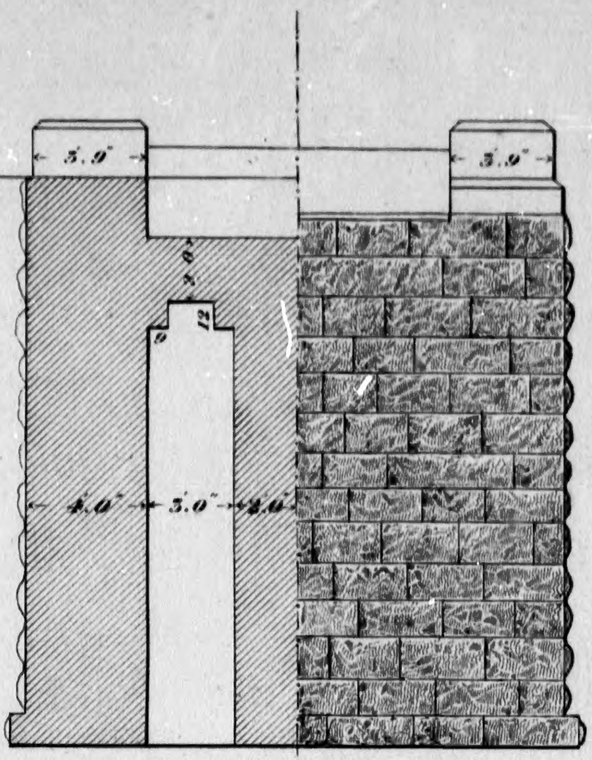
of Abutment for Beam Bridges referred to in
Table T Column Nº 4.

The length of Abutment AB is in all cases equal to the height of formation above Paving at C.D.

W. J. Forrest del.

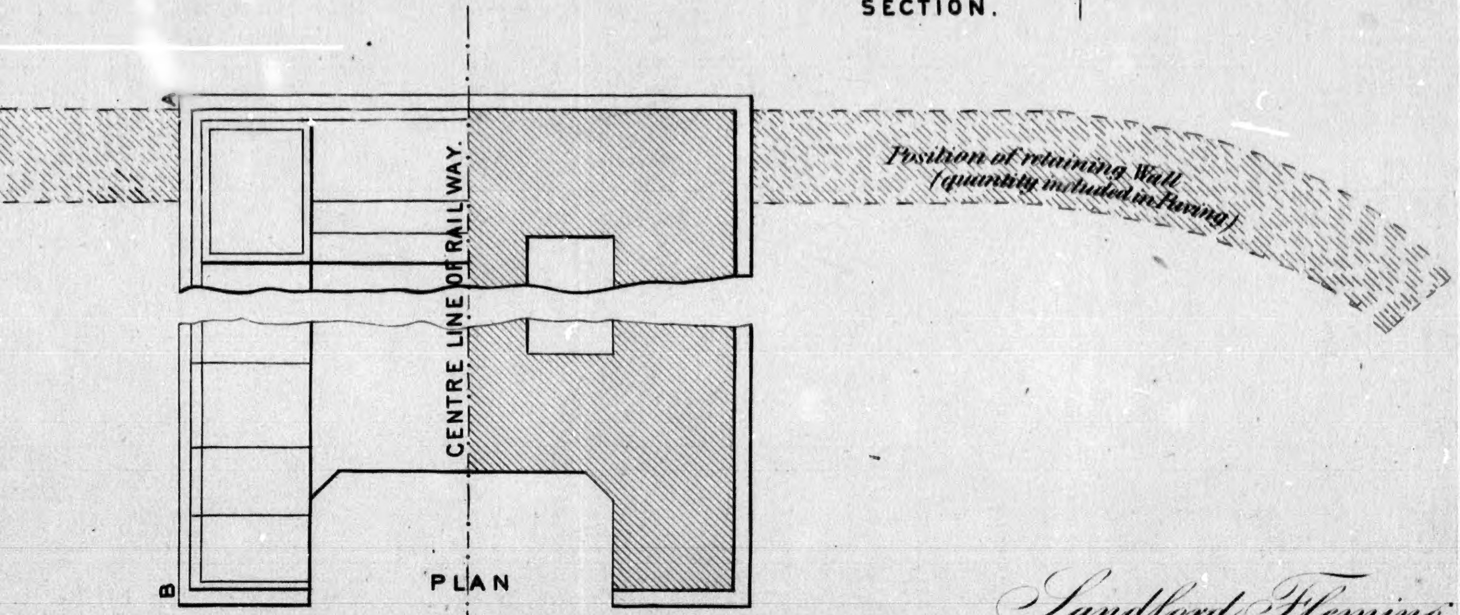


LONGITUDINAL SECTION



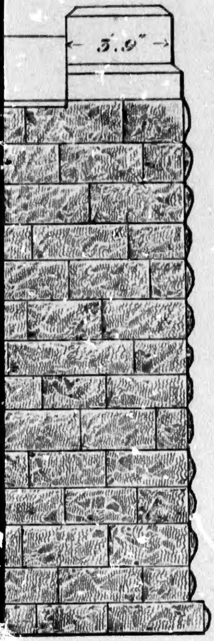
HALF TRANSVERSE SECTION.

HALF FRONT ELEVATION

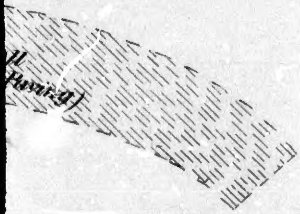


PLAN

Sandford Fleming
Chief Engineer.



FRONT ELEVATION



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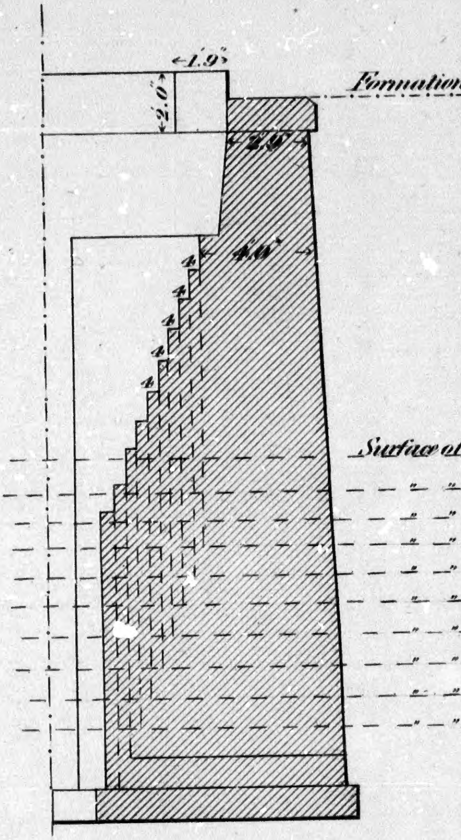
Chief Engineer.

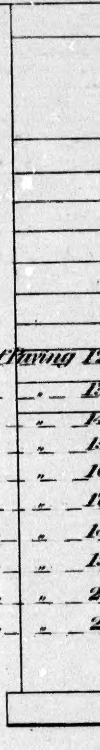
DIAGRAM

Being Details of Beam Bridges of grea
General Plan Sheet No. 11 The correspond
in Columns No. 3 of the accompanying tab



SECTION OF WING WALL

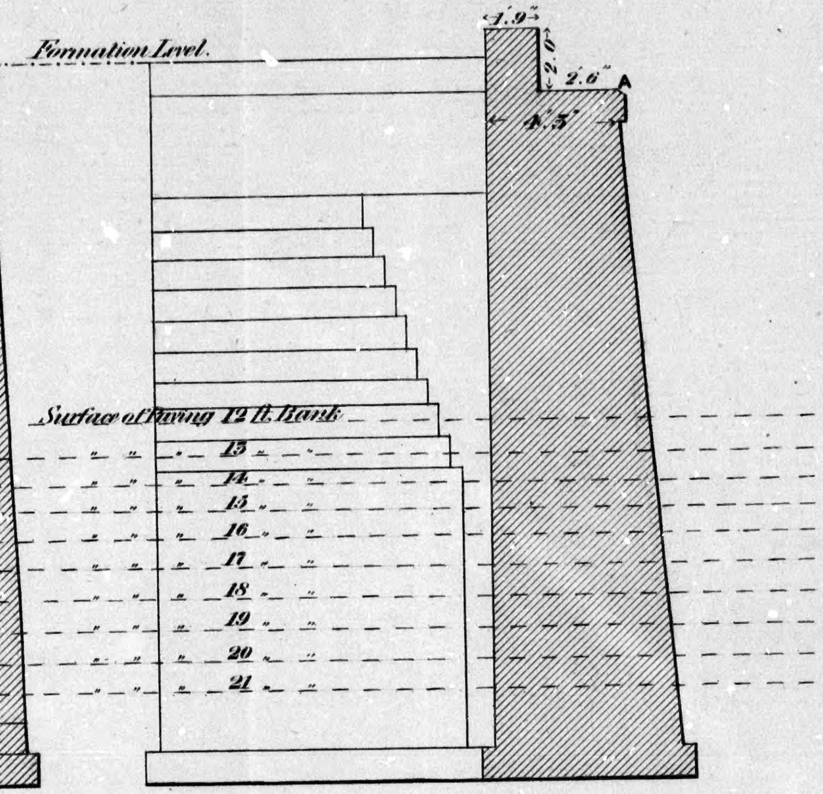
The length AB of the Wing Walls is in all cases equal to the height of Formation above Paving.



S

DIAGRAM

Beam Bridges of greater height than shown on
eet Nº 11 The corresponding quantities will be found
f the accompanying table (T)



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SECTION OF ABUTMENT.

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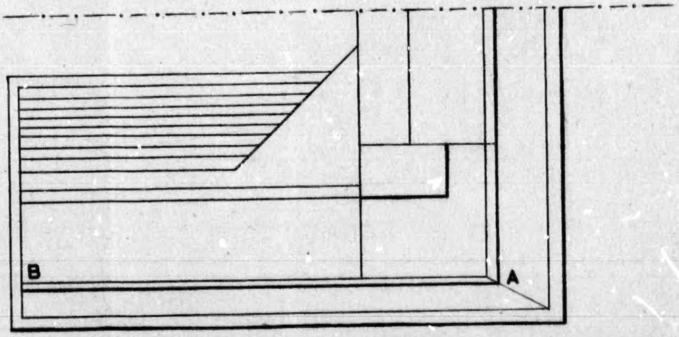

HALF PLAN OF ABUTMENT.